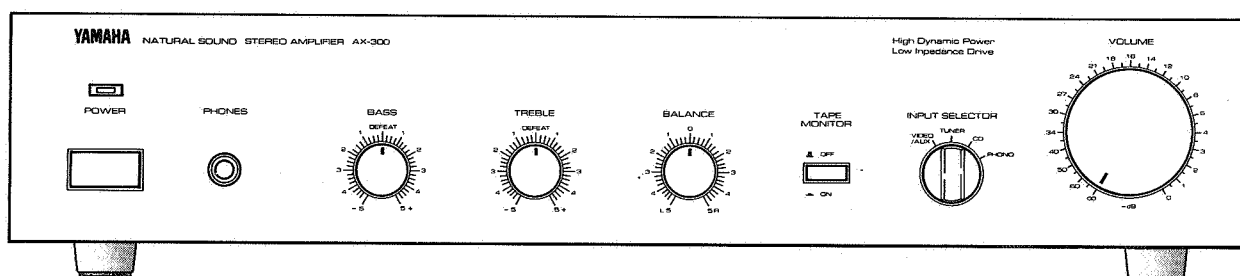


NATURAL SOUND STEREO AMPLIFIER AX-300

SERVICE MANUAL

FRONT PANEL



IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification, recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

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AX-300

100086

SINCE 1887




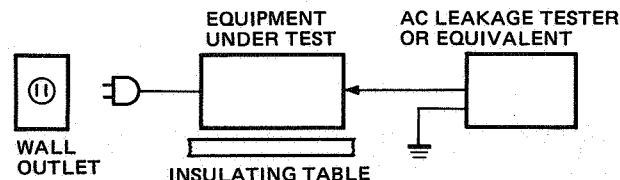
YAMAHA

NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

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■ TO SERVICE PERSONNEL

1. Critical Components Information.
Components having special characteristics are marked  and must be replaced with parts having specifications equal to those originally installed.
2. Leakage Current Measurement (For 120V Model Only).
When service has been completed, it is imperative that you verify that all exposed conductive surfaces are properly insulated from supply circuits.
 - Meter impedance should be equivalent to 1500 ohm shunted by 0.15 μ F.
 - Leakage current must not exceed 0.5mA.
 - Be sure to test for leakage with the AC plug in both polarities.



■ SPECIFICATIONS

Minimum RMS Output Power Per Channel	
20Hz~20kHz 0.05% THD 8 Ω	30W
DIN Standard Output Power Per Channel (G)	
1kHz 1% THD 4 Ω	40W
Dynamic Power (A, G, B)	
1kHz 1% THD 8 Ω /4 Ω	55W/75W
IEC Power (G)	
1kHz 0.01% THD 8 Ω	35W
Power Band Width	
0.05% THD 15W 8 Ω	10Hz~50kHz
Damping Factor	
1kHz 8 Ω	40
Input Sensitivity/Impedance (R, U, C)	
Phono MM	2.5mV/47k Ω
VIDEO·AUX/TAPE/TUNER/CD	150mV/50k Ω
Input Sensitivity (New IHF) (R, U, C)	
Phono MM	0.47mV
VIDEO·AUX/TAPE/TUNER/CD	28mV
Maximum Input Signal	
0.02% THD 1kHz Phono MM	170mV
Output Level/Impedance	
REC OUT	150mV/560 Ω
Headphone Jack Rated Output/Impedance	
0.05% THD 8 Ω	0.5V/220 Ω
Frequency Response (VIDEO·AUX/TAPE/TUNER/CD)	
20Hz~20kHz	+0/-0.5dB
RIAA Equalization Deviation	
Phono MM RIAA	\pm 0.5dB
Total Harmonic Distortion (20Hz~20kHz)	
Phono MM to REC OUT 3V	0.01%
VIDEO·AUX/TAPE/TUNER/CD to SP OUT 15W/8 Ω	0.01%
Intermodulation Distortion (VIDEO·AUX/TAPE/TUNER/CD)	
Rated Output/8 Ω	0.05%

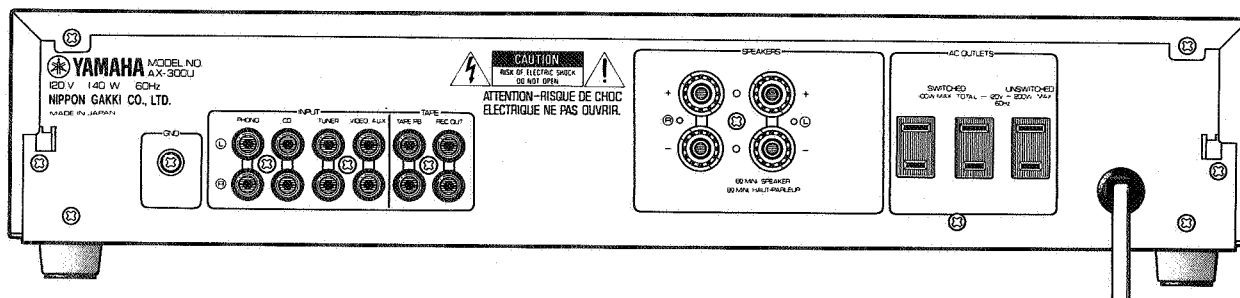
Signal to Noise Ratio (IHF-A-Network)	
Phono MM (5mV Input Shorted)	88dB
	(82dB-European)
VIDEO·AUX/TAPE/TUNER/CD (Shorted)	100dB
Signal to Noise Ratio (New IHF)	
Phono MM	74dB
VIDEO·AUX/TAPE/TUNER/CD	85dB
Residual Noise (IHF-A-Network)	
Channel Separation (Vol. -30dB)	160 μ V
Phono MM	
(Input Shorted 1kHz/10kHz)	60dB/40dB
VIDEO·AUX/TAPE/TUNER/CD (Input 5.1k Ω)	60dB/40dB
Terminated 1kHz/10kHz)	60dB/40dB
Tone Control Characteristics	
BASS boost/cut	\pm 10dB (at 20Hz)
BASS turnover frequency	350Hz
TREBLE boost/cut	\pm 10dB (at 20kHz)
TREBLE turnover frequency	3.5kHz
Gain Tracking Error (0~-60dB)	
	2dB
Power Supply	
U.S.A. & Canadian models	AC120V 60Hz
European model	AC220V 50Hz
British and Australian models	AC240V 50Hz
General model	AC110/120/220/240V 60/50Hz
Power Consumption	
U.S.A. & Canadian models	140W
British, Australian, and European models	180W
General model	120W
Dimensions (WxHxD)	
	435x92x293mm
	(17-1/8"x3-5/8"x11-9/16")
Weight	
	4.6kg

* Specifications subject to change without notice.

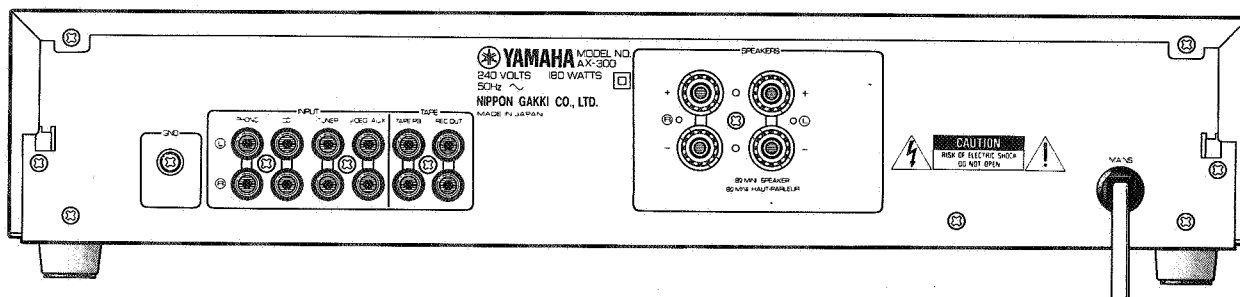
- (U) U.S.A. model
 (C) Canadian model
 (A) Australian model
 (G) European model
 (B) British model
 (R) General model

REAR PANELS

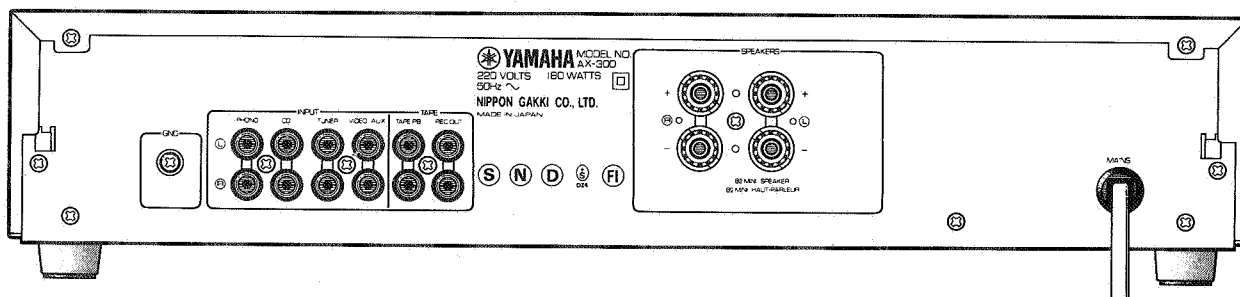
U.S.A. & Canadian models



Australian & British models

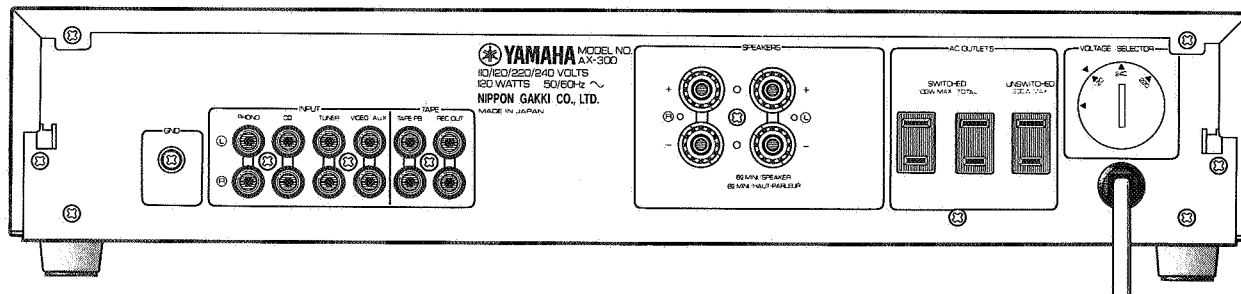


European & North European models

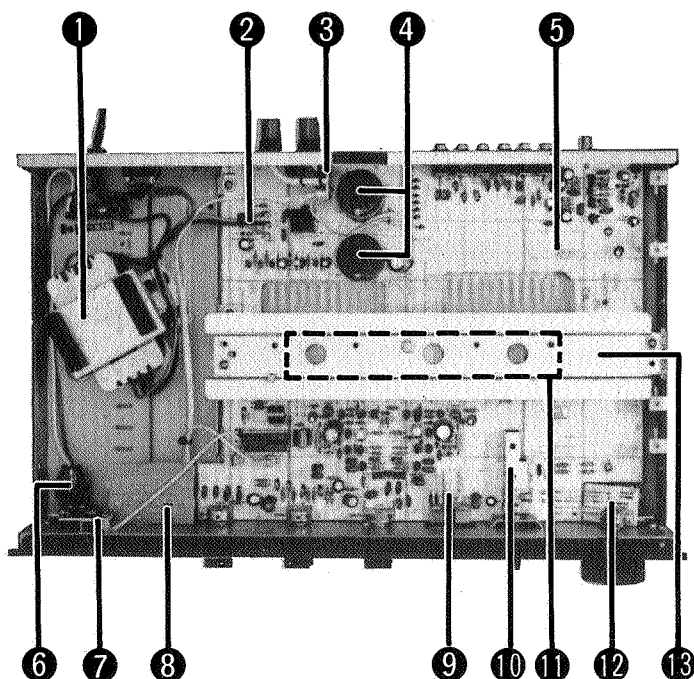


AX-300

Others model



INTERNAL VIEW



- ① POWER TRANSFORMER
U.S.A. & Canadian models: GA681000
European & North European models: GA681100
Australian & British models: GA681200
Other models: MZ08919 (Assembly)
- ② DIODE BRIDGE
- ③ MAIN CIRCUIT BOARD (4)
- ④ 6800μF ELECTROLYTIC CAPACITOR
- ⑤ MAIN CIRCUIT BOARD (1)
- ⑥ POWER SWITCH
- ⑦ MAIN CIRCUIT BOARD (5)
- ⑧ MAIN CIRCUIT BOARD (3)
- ⑨ TAPE MONITOR SWITCH (SW102)
- ⑩ INPUT SELECTOR SWITCH (SW101)
- ⑪ POWER TRANSISTOR (a pair)
- ⑫ MAIN CIRCUIT BOARD (2)
- ⑬ RADIATOR

DISASSEMBLY PROCEDURES

(Remove parts in disassembly order as numbered)

1. Removal of Top Cover

- a. Remove 4 screws (①) in Fig. 1.
- b. Remove 2 screws (②) in Fig. 1, and slide the Top Cover back.

2. Removal of Front Panel

Remove 5 screws (③) in Fig. 1, and pull the Front Panel forward.

3. Removal of Bottom Cover

Remove 5 screws (④) in Fig. 1.

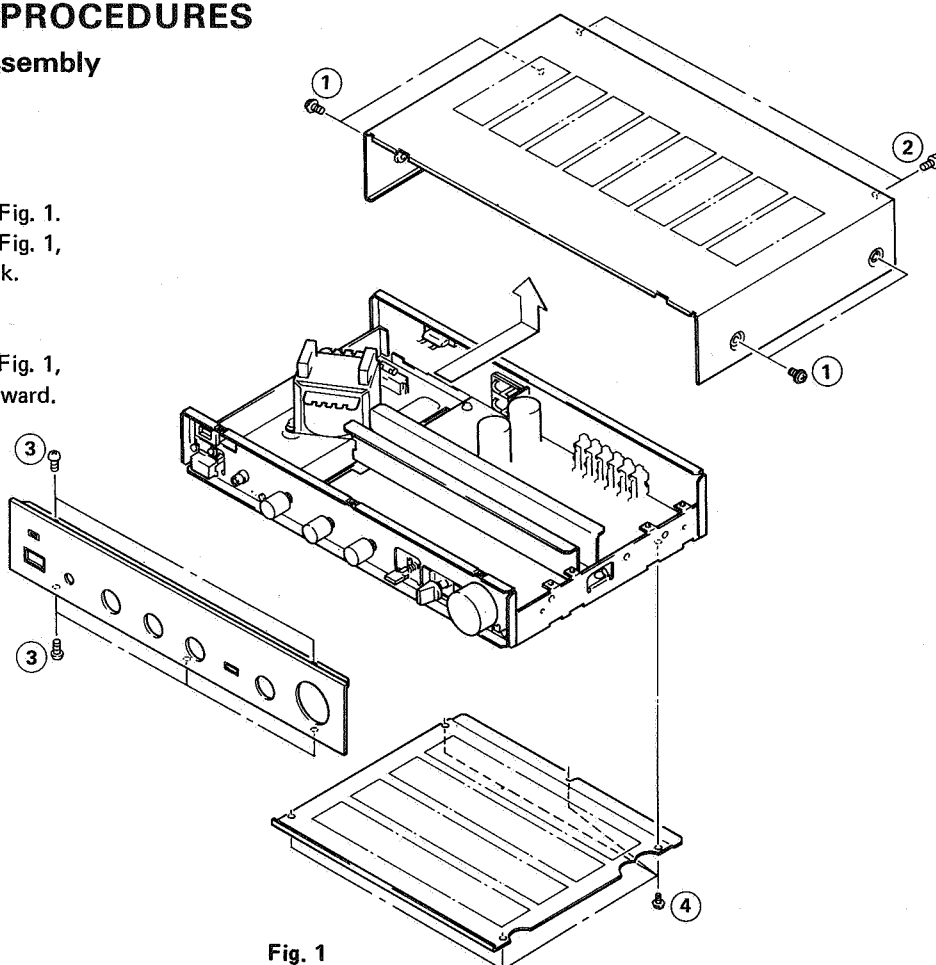
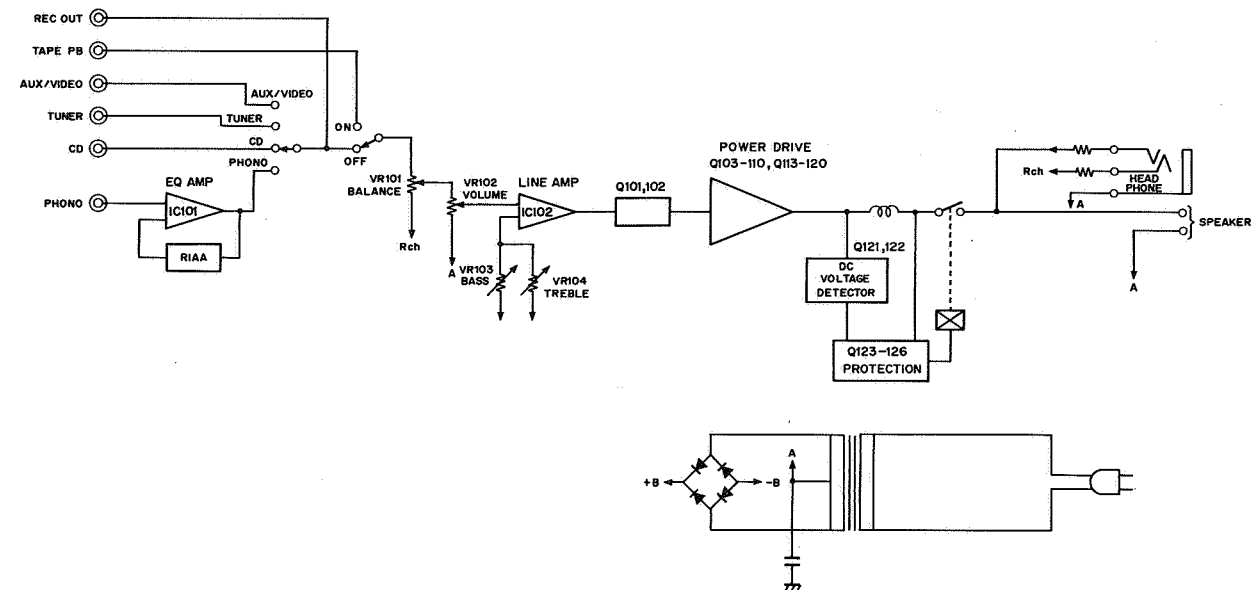
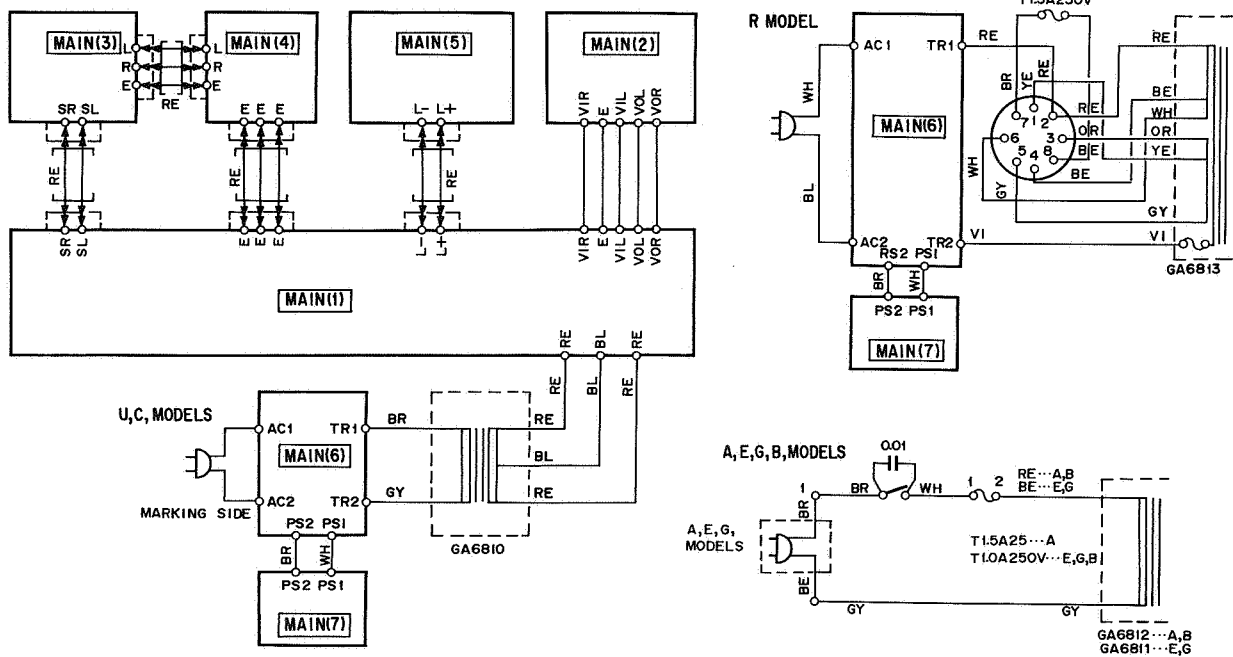


Fig. 1

■ BLOCK DIAGRAM



■ WIRING

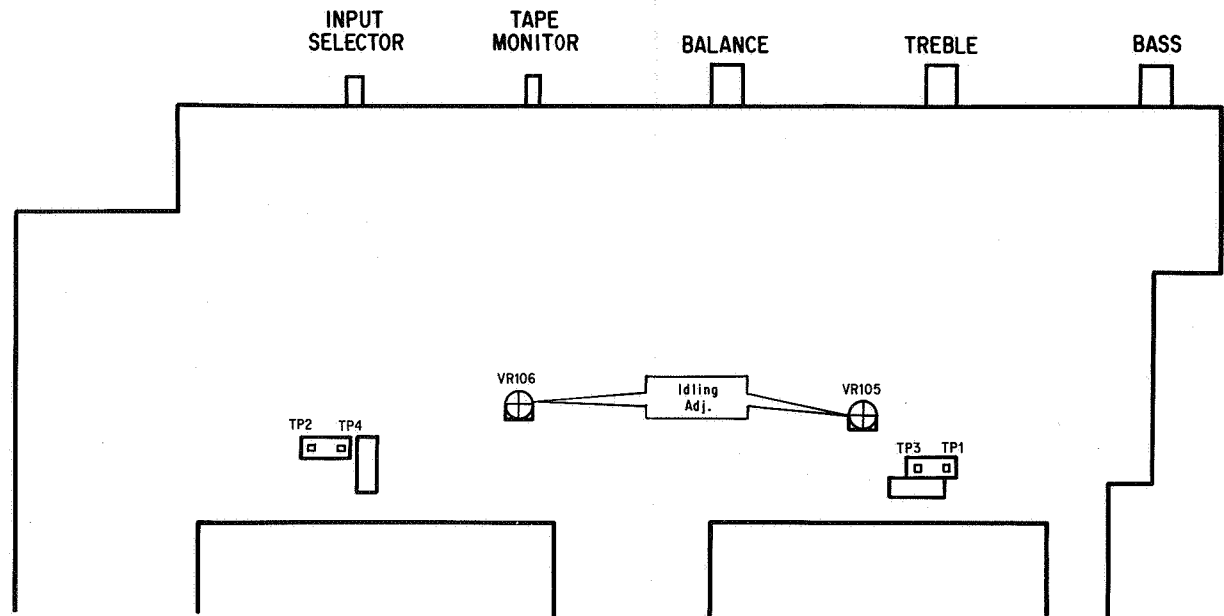


■ ADJUSTMENTS

● IDLING CURRENT ADJUSTMENT
When replacing the power and drive transistors, adjust idling current. After the power has been turned on, age about 5 minutes in non loaded condition.

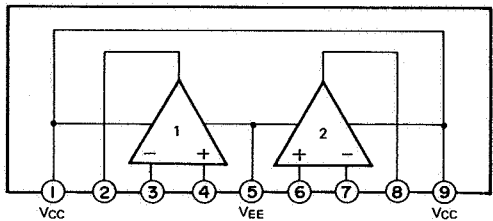
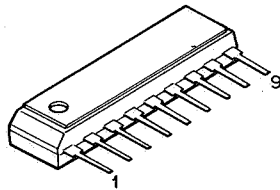
	Test Points	Adjustment points	Rating
Lch	TP1 ↔ TP3	VR105	10mV±3mV DC.
Rch	TP2 ↔ TP4	VR106	10mV±3mV DC.

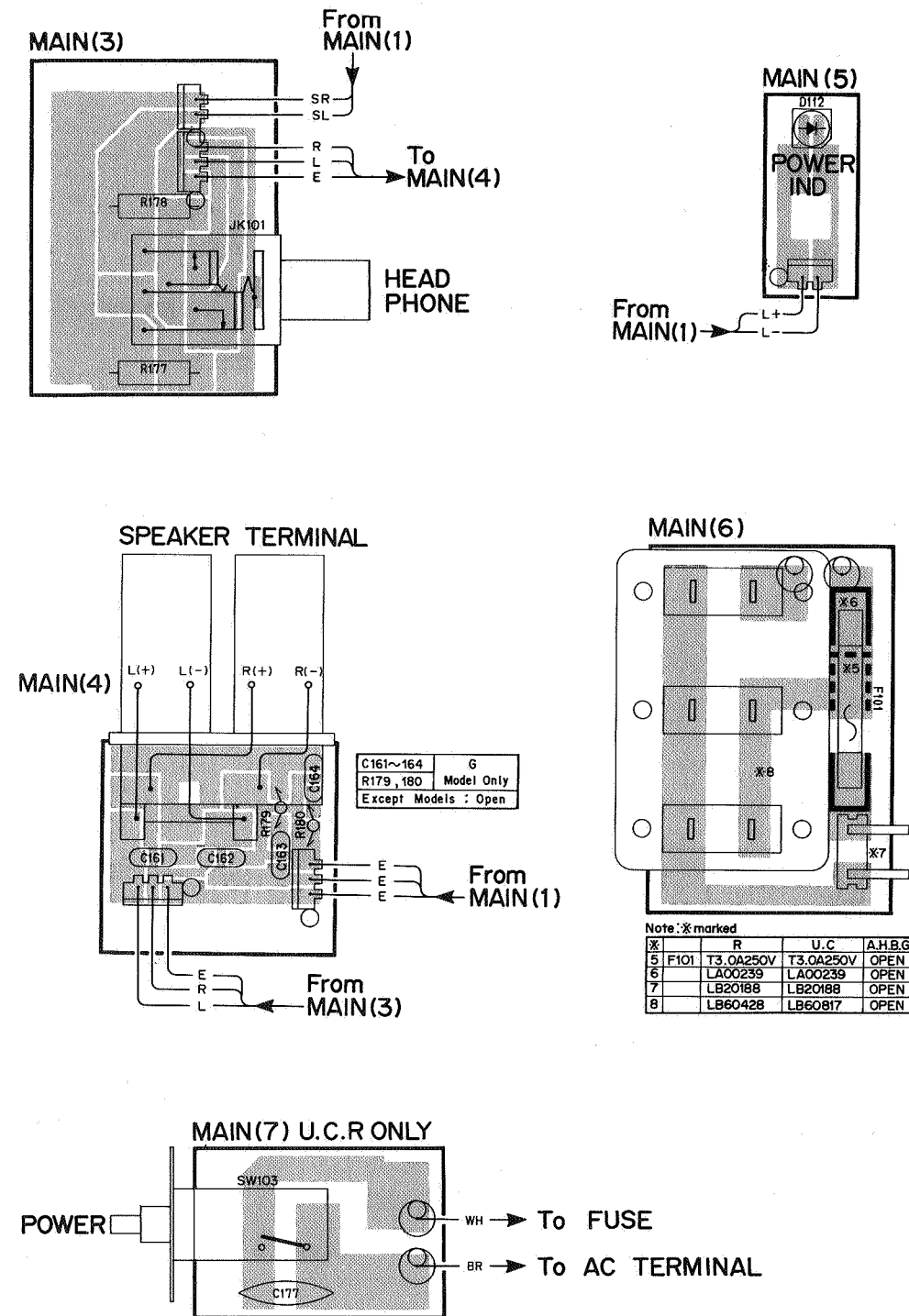
■ ADJUSTMENT POINTS



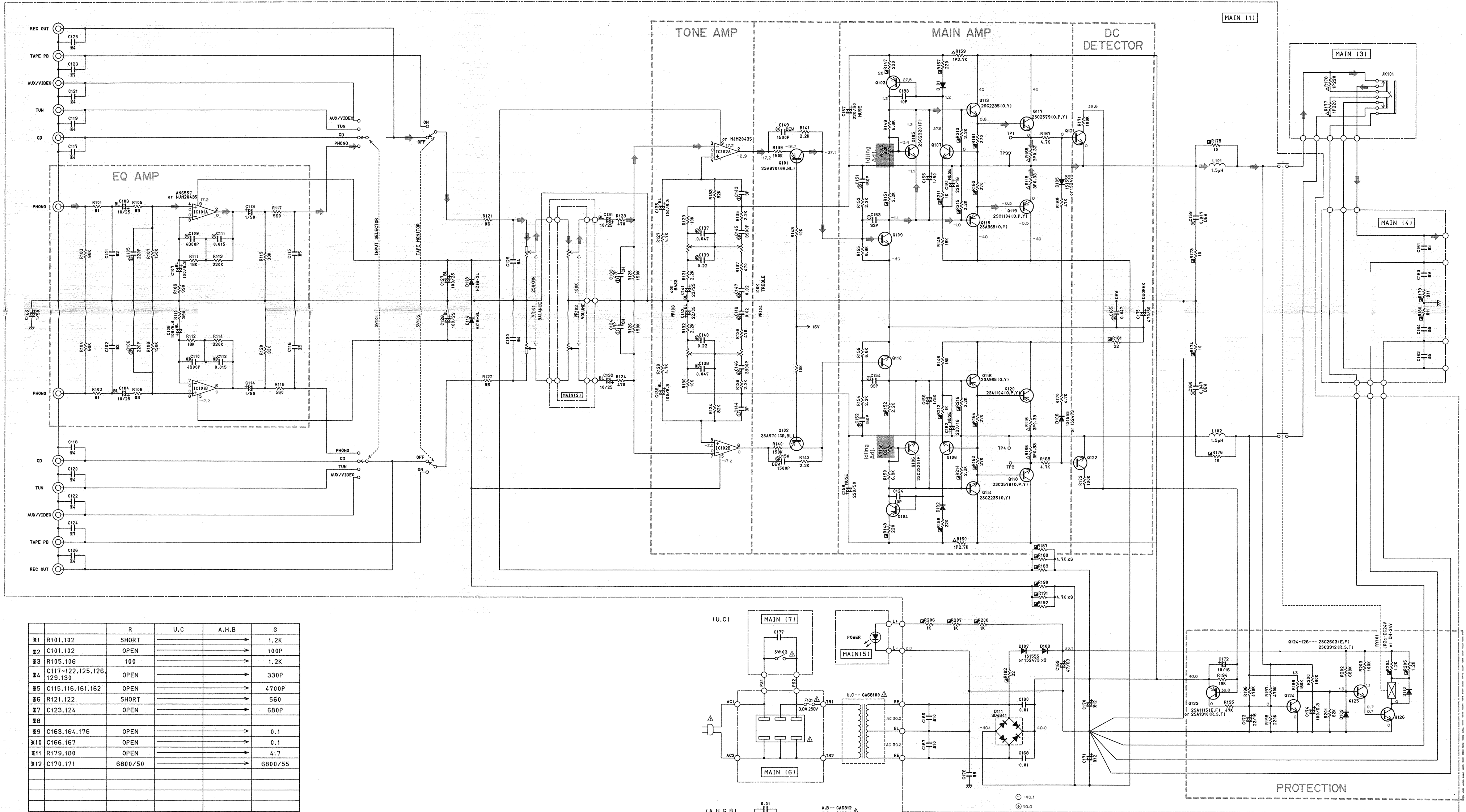
■ IC BLOCK

AN6557

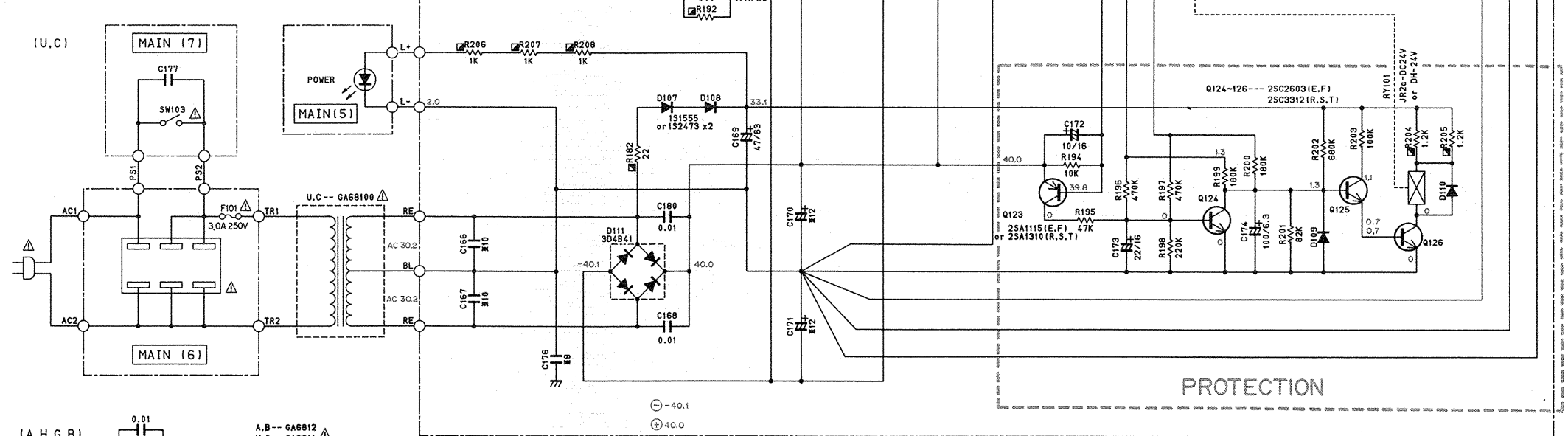




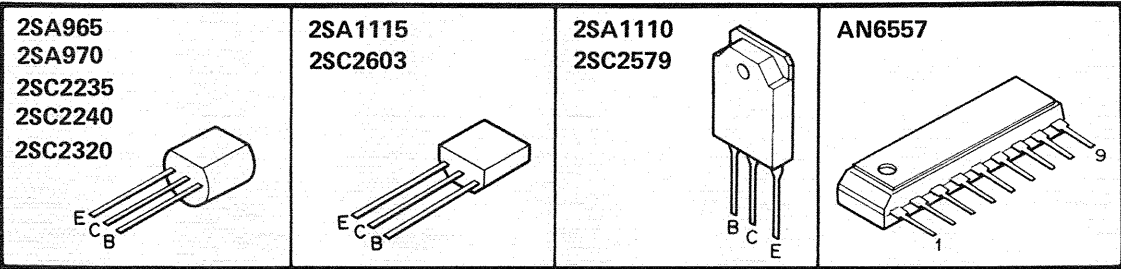
SCHEMATIC DIAGRAM



	R	U.C	A.H.B	G
1	R101,102	SHORT		1.2K
2	C101,102	OPEN		100P
3	R105,106	100		1.2K
4	C117-122,125,126,129,130	OPEN		330P
5	C115,116,161,162	OPEN		4700P
6	R121,122	SHORT		560
7	C123,124	OPEN		680P
8				
9	C163,164,176	OPEN		0.1
10	C166,167	OPEN		0.1
11	R179,180	OPEN		4.7
12	C170,171	6800/50		6800/55



PIN CONNECTION DIAGRAM OF TRANSISTORS AND IC.




CAUTION

- Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.
- All voltages are measured with a 10MS/V DC electric volt meter.
- Schematic diagram is subject to change without notice.

PARTS LIST

ELECTRICAL PARTS

■ WARNING

- Components having special characteristics are marked  and must be replaced with parts having specifications equal to those originally installed.
- Carbon resistors 1/4 W are not included in the ELECTRICAL PARTS list. For the parts No. of the carbon resistor, refer to P. 15.

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Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	NA 09 26 50	Main Circuit Board	メ イ ン シ ー ト			R	
	NA 09 26 60	"	"			U,C	
	NA 09 26 70	"	"			A,B,E	
	NA 09 26 80	"	"			G	
	FG 21 11 00	Ceramic Capacitor	セ ラ コ ン	C183,184			
	FG 21 21 00	"	"	C101,102		G	
	FG 21 23 30	"	"	C117~122 C125,126,129,130		G	
	FG 21 26 80	"	"	C123,124		G	
	FG 24 41 00	"	"	C168,180			
	FI 38 41 00	"	"	C177	} inter- changeable	R,U,C	
	FI 50 41 00	"	"	"		"	
	FU 35 03 00	Mica Capacitor	マ イ カ コ ン	C143,144			
	FU 35 13 30	"	"	C153,154			
	FU 35 14 70	"	"	C133,134			
	FZ 00 29 00	Electrolytic Cap	ブ ロ ッ ク ケ ミ コ ン	C170,171		G	
*	VC 65 79 00	"	"	"		U,C,A,B,E,R	
	FZ 00 54 10	"	ブ ラ ッ ク ゲ ー ト ケ ミ コ ン	C107,108,135,136			
	FZ 00 54 20	"	"	C103,104,131,132			
	FZ 00 64 10	"	"	C141,142			
	FZ 00 61 40	"	"	C127,128			
	UH 11 81 00	"	ケ ミ コ ン	C174			
	UH 13 71 00	"	"	C172			
	UH 13 72 20	"	"	C173			
	UH 16 61 00	"	"	C113,114,155,156,165			
	Ui 37 74 70	"	"	C169			
	UM 32 82 20	"	オー ディ オ ケ ミ コ ン	C181,182			
	UJ 16 82 20	"	"	C157,158			
*	VC 79 36 00	"	ディ オ レ ッ ク ス ケ ミ コ ン	C175			
	FC 36 31 50	Mylar Cap.	マ イ ラ ー コ ン	C149,150			
	FZ 00 55 80	"	"	C159,160,185			
	FA 15 33 90	"	"	C145,146			
	UA 25 34 30	"	"	C109,110			
	UA 25 34 70	"	"	C115,116,161,162		G	
	FA 15 41 00	"	"	C166,167		G	
	FA 15 41 50	"	"	C111,112			
	UA 25 42 00	"	"	C147,148			
	UA 25 44 70	"	"	C137,138			
	UA 25 51 00	"	"	C163,164,176		G	
	UA 25 52 20	"	"	C139,140			
	UT 45 21 50	Polypropylene Film Cap.	ポ リ プ ロ コ ン	C151,152			
	UT 65 22 20	"	"	C105,106			
*	VC 79 37 00	Coil	ア ウ ト ブ ッ ト コ イ ル	L101,102			
	HV 45 34 70	Flame Proof Carbon Resistor	不 燃 化 カ ー ボ ン 抵 抗	R179,180		G	
	HV 45 41 00	"	"	R173~176			
	HV 45 42 20	"	"	R181,182			
	HV 45 52 20	"	"	R147,148,157,158			
	HV 45 52 70	"	"	R161~164			
	HV 45 61 00	"	"	R206~208,211,212			
	HV 45 61 20	"	"	R204,205			
	HV 45 62 20	"	"	R151,152,213~216			

* New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	HV 45 64 70	Flame Proof Carbon Resistor	4.7K Ω 1/4W	不燃化カーボン抵抗	R187~192		
	HL 71 52 20	Metal Oxide Film Resistor	220 Ω 1W	酸 金 抵 抗	R177,178		
	HL 31 62 70	//	2.7K Ω 1W	//	R159,160		
	HZ 00 21 60	Metal Plate Resistor	0.33 Ω 3W	金 属 板 抵 抗	R115,116,165,166	Inter-changeable	
	HZ 00 24 80	//	0.33 Ω 2W	//	//		
	VB 86 12 00	Pre-Set Potentiometer	B2.2K Ω	半 固 定 抵 抗	VR105,106		
※	VC 47 53 00	Potentiometer	100K \times 2	可 変 抵 抗 器	VR102		
※	VC 49 69 00	//	250KMN	//	VR101		
※	VC 47 47 00	//	40K \times 2	//	VR103		
※	VC 47 48 00	//	100K \times 2	//	VR104		
	iA 09 70 00	Transistor	2SA970(GR,BL)	ト ラ ン ジ ス タ	Q101~104		
	iA 11 15 10	//	2SA1115(E,F)	//	Q123	Inter-changeable	
	iA 13 10 00	//	2SA1310(R,S,T)	//	//		
	iC 22 40 00	//	2SC2240(GR,BL)	//	Q107~110,121,122		
	iC 26 03 10	//	2SC2603(E,F)	//	Q124~126	Inter-changeable	
	iC 33 12 00	//	2SC3312(R,S,T)	//	//		
	iC 23 20 40	//	2SC2320(F)	//	Q105,106		
	iA 09 65 00	//	2SA965(O,Y)	//	Q115,116		
	iC 22 35 00	//	2SC2235(O,Y)	//	Q113,114		
	iX 60 35 00	//	2SA1104(O,P,Y)	//	Q119,120		
	iX 60 35 10	//	2SC2579(O,P,Y)	//	Q117,118		
	iH 00 10 30	Diode Bridge	3D4B41	ダイオードブリッジ	D111		
	iF 00 30 30	Zener Diode	HZ16-3L	ツェナーダイオード	D113,114		
	iF 00 06 70	Diode	1S2473	ダ イ オ ー ド	D101,102 D105~110	Inter-changeable	
	iF 00 00 40	//	1S1555	//	//		
	iF 00 42 70	LED	SLR-55URC3H	L E D	D112		
	iG 08 52 00	IC	AN6557	I C	IC101	Inter-changeable	
	iG 08 02 00	//	NJM2043S	//	//		
	iG 08 02 00	//	//	//	IC102		
	KA 80 32 10	Push Switch	SDL1P	プッシュスイッチ	SW103	R,U,C	Δ
	KA 80 51 10	//	SUN2-2NS	//	SW102		
※	VC 47 49 00	Rotary Switch	NS	ロータリースイッチ	SW101		
	KB 00 03 60	Fuse	T3.0A 250V	ヒ ュ ー ズ	F101	R	Δ
	KB 00 18 80	//	3.0A 250V	//	F101	U,C	Δ
	KC 00 20 00	Relay	JR2a-DC24V	リ レ ー	RY101	Inter-changeable	
	KC 00 19 40	//	DH-24V	//	//		
	LB 60 76 10	Head Phone Jack		ヘッドホンジャック	JK101		
	LB 40 10 30	Pin Jack	4P	ピンジャック	PJ102,103		
	LB 40 12 90	//	4P	//	PJ101		
	LA 00 23 20	Lapping Terminal	P=7.5 3P	i 型ラッピング端子板			
	LA 00 20 00	//	P=7.5 2P	//			
	LA 00 23 90	//	P=7.5 2P	L 型 //		R,U,C	

※ New Parts (新規部品) NR

AX-300

[illegible]

※ New Parts (新規部品) NR

A

B

C

D

E

AX-300

MECHANISM EXPLODED VIEW

1

2

3

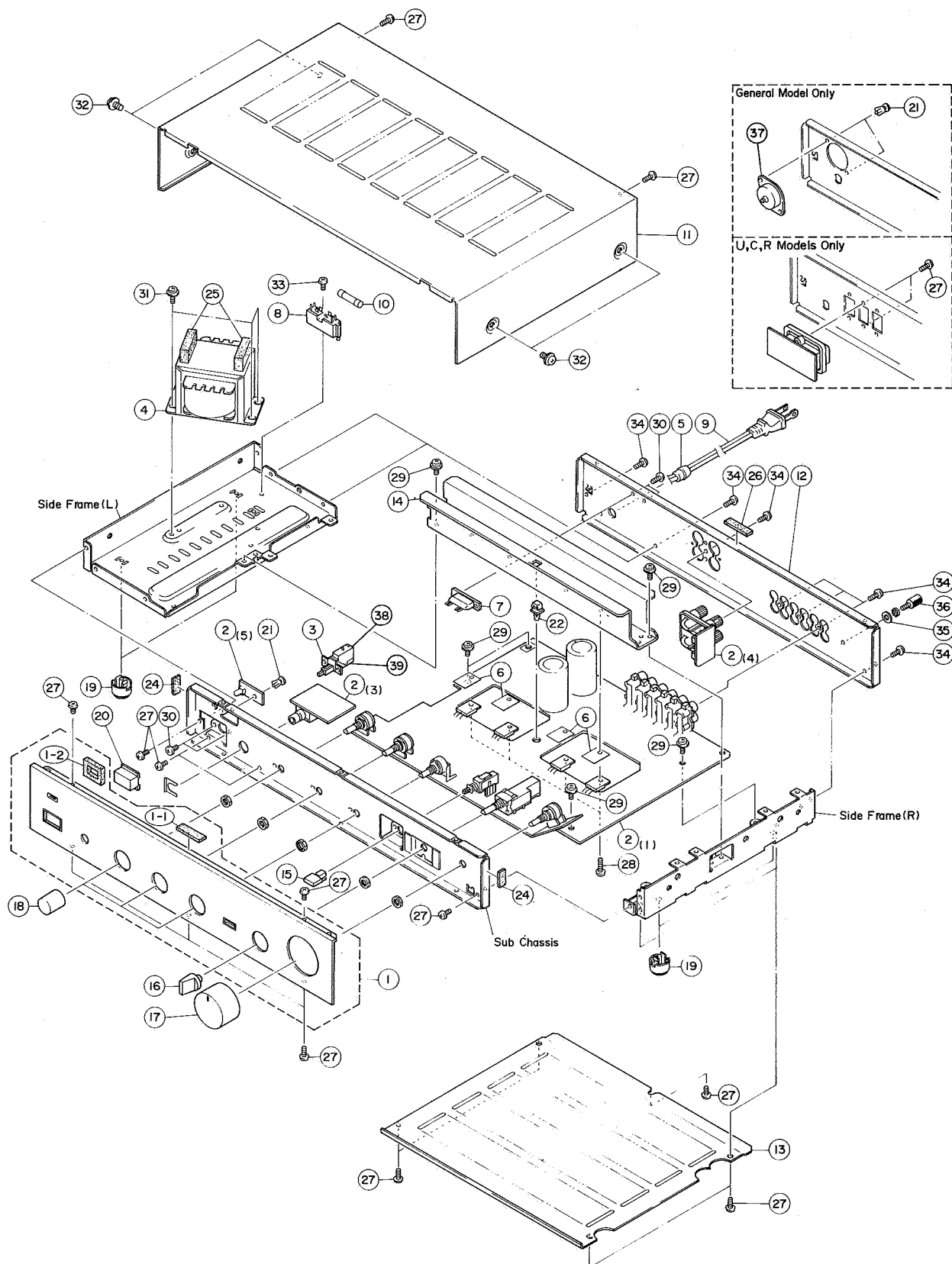
4

5

6

7

12



MECHANISM PARTS

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※ 1	NB 64 01 10	Panel Unit	パ ネ ル ユ ニ ッ ト	Black		A,E,G,B,R	
※ //	NB 64 01 20	//	//	Silver		//	
※ //	NB 64 07 00	//	//	Black		U,C	
※ //	NB 64 07 10	//	//	Silver		//	
1-1	CB 61 03 50	Rubber Cushion	防 振 ゴ ム		A-320		
※ 1-2	CB 66 14 40	Cushion	ク ッ シ ョ ン				
2	NA 09 26 60	Main Circuit Board	メ イ ン シ ー ト			U,C	
※ //	NA 09 26 70	//	//			A,E,B	
※ //	NA 09 26 80	//	//			G	
※ //	NA 09 26 50	//	//			R	
3	KA 80 32 10	Push Switch	電 源 ス イ ッ チ	Power	A-320	A,E,G,B	
4	GA 68 13 00	Power Transformer	電 源 ト ラ ン ス		A-320	R	
//	GA 68 10 00	//	//			U,C	△
//	GA 68 11 00	//	//			E,G	△
//	GA 68 12 00	//	//			A,B	△
5	CB 61 68 10	Cord Stopper	CM-22A	コ ー ド ス ト ッ パ ー		U,C	
//	CB 62 01 90	//	CM-22B	//		A,E,G,B,R	
6	iL 00 05 70	Mica Base	MT-100	マ イ カ ベ ー ス			
7	LA 00 29 50	Terminal	2P MA0092A	2 P 中 継 タ ー ミ ナ ル		A,E,G,B	
8	LB 20 13 00	Fuse Holder		ヒ ュ ー ズ ホ ル ダ ー		A,R	
//	LB 20 21 10	//		//		E,G,B	
9	MG 00 09 20	Power Cord	7.5A 250V 2.5m	電 源 コ ー ド	Interchangeable	A	△
//	MG 00 14 90	//	//	//		A	△
//	MG 00 23 10	//	7.5A 250V 2m	//	Interchangeable	A	△
//	MG 00 09 60	//	2.5A 250V 2m	//		E,G	△
//	MG 00 16 20	//	//	//	Interchangeable	E,G	△
//	MG 00 23 20	//	//	//		E,G	△
//	MG 00 22 20	//	10A 125V 1.98m	//	Interchangeable	U,C	△
//	MG 00 23 60	//	10A 125V 1.98m	//		U,C	△
//	MG 00 16 30	//	6A 250V 2m	//		R	△
//	MG 00 18 60	//	2.5A 250V 2m	//		B	△
10	KB 00 03 40	Fuse	T1.5A 250V	ヒ ュ ー ズ		R,A	△
//	KB 00 07 30	//	T1.0A 250V	//		E,G,B	△
11	AA 61 31 60	Top Cover		ト ッ プ カ バ ー	Silver		
//	AA 61 37 70	//		//	Black		
※ 12	AA 63 19 00	Rear Panel		リ ヤ パ ネ ル		R	
※ //	AA 63 19 10	//		//		U,C	
※ //	AA 63 19 20	//		//		A,B	
※ //	AA 63 19 30	//		//		E,G	
13	AA 60 66 90	Bottom Cover		ボ ト ム カ バ ー			
14	BA 08 39 30	Radiator		ラ ジ エ タ ー			
15	CB 63 42 40	Push Button		プ ッ シ ュ ボ タ ン	Silver	A-520	
//	CB 63 42 30	//		//	Black	A-520	
16	CB 63 82 70	Knob	φ20	ノ ブ	Silver INPUT SELECTOR		
//	CB 63 82 80	//	//	//	Black //		
※ 17	BA 09 60 60	//	φ42	//	Silver VOLUME		
※ //	BA 09 65 50	//	//	//	Black //		
18	CB 66 00 70	Knob	φ20	ノ ブ	Silver BASS, TREBLE, BALANCE		
//	CB 66 00 60	//	//	//	Black //		
19	CB 61 03 90	Leg		脚		K-200	
20	CB 66 08 00	Button		ボ タ ン	Silver	AX-900	
//	CB 66 08 10	//		//	Black	AX-900	

※ New Parts (新規部品) NR

AX-300

※ New Parts (新規部品) NR

Parts List for Carbon Resistor

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ353100	※	12K Ω	HJ357120	HF857120
1.8 "	HJ353180	※	15 "	HJ357150	HF857150
2.2 "	HJ353220	HF853220	18 "	HJ357180	HF857180
3.3 "	HJ353330	HF853330	22 "	HJ357220	HF857220
4.7 "	HJ353470	HF853470	27 "	HJ357270	HF857270
5.6 "	HJ353560	HF853560	33 "	HJ357330	HF857330
10 "	HJ354100	HF854100	39 "	HJ357390	HF857390
15 "	HJ354150	HF854150	47 "	HJ357470	HF857470
22 "	HJ354220	HF854220	56 "	HJ357560	HF857560
27 "	HJ354270	HF854270	68 "	HJ357680	HF857680
33 "	HJ354330	HF854330	82 "	HJ357820	HF857820
39 "	HJ354390	HF854390	91 "	HJ357910	HF857910
47 "	HJ354470	HF854470	100 "	HJ358100	HF858100
56 "	HJ354560	HF854560	120 "	HJ358120	HF858120
68 "	HJ354680	HF854680	150 "	HJ358150	HF858150
82 "	HJ354820	HF854820	180 "	HJ358180	HF858180
100 "	HJ355100	HF855100	220 "	HJ358220	HF858220
110 "	HJ355110	HF855110	270 "	HJ358270	HF858270
120 "	HJ355120	HF855120	330 "	HJ358330	HF858330
150 "	HJ355150	HF855150	390 "	HJ358390	HF858390
160 "	HJ355160	※	470 "	HJ358470	HF858470
180 "	HJ355180	HF855180	560 "	HJ358560	HF858560
220 "	HJ355220	HF855220	680 "	HJ358680	HF858680
270 "	HJ355270	HF855270	820 "	HJ358820	HF858820
330 "	HJ355330	HF855330	1.0M Ω	HJ359100	HF859100
390 "	HJ355390	HF855390	1.2 "	HJ359120	※
470 "	HJ355470	HF855470	1.5 "	HJ359150	HF859150
510 "	※	HF855510	1.8 "	HJ359180	HF859180
560 "	HJ355560	HF855560	2.2 "	HJ359220	HF859220
680 "	HJ355680	HF855680	3.3 "	HJ359330	HF859330
820 "	HJ355820	HF855820	3.9 "	HJ359390	※
910 "	HJ355910	HF855910	4.7 "	HJ359470	※
1.0K Ω	HJ356100	HF856100			
1.2 "	HJ356120	HF856120			
1.5 "	HJ356150	HF856150			
1.8 "	HJ356180	HF856180			
2.0 "	HJ356200	HF856200			
2.2 "	HJ356220	HF856220			
2.4 "	HJ356240	HF856240			
2.7 "	HJ356270	HF856270			
3.0 "	HJ356300	HF856300			
3.3 "	HJ356330	HF856330			
3.6 "	HJ356360	HF856360			
3.9 "	HJ356390	HF856390			
4.7 "	HJ356470	HF856470			
5.1 "	HJ356510	HF856510			
5.6 "	HJ356560	HF856560			
6.8 "	HJ356680	HF856680			
8.2 "	HJ356820	HF856820			
9.1 "	HJ356910	HF856910			
10 "	HJ357100	HF857100			

1/4W Type
HJ35○○○○
10mm

1/6W Type
HF85○○○○
5mm

JUL. '85

AX-300



YAMAHA

AX-300

